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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,177	08/17/2001	Nicole Schodel	LINDE-567	1429

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MILLEN, WHITE, ZELANO & BRANIGAN, P.C.  
2200 CLARENDON BLVD.  
SUITE 1400  
ARLINGTON, VA 22201

EXAMINER

DUONG, THANH P

ART UNIT PAPER NUMBER

1764

DATE MAILED: 07/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/931,177

Applicant(s)

SCHODEL ET AL.

Examiner

Tom P Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 11-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/26/01.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

Restriction to one of the following inventions is required under 35 U.S.C.

121:

- I. Claims 1-10, drawn to reactor for performing a heat-conditioned catalytic reaction, classified in class 422, subclass 173.
- II. Claims 11-24, drawn to method of performing endothermic or exothermic reaction, classified in class 208, subclass 46.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice.

The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the process as claimed can be practiced by another materially difference apparatus such as the use of a shell and tube reactor to perform the catalytic reaction other than a plate type reactor.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

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Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. Brion P. Heaney on July 19, 2004 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-10. Affirmation of this election must be made by applicant in replying to this Office action. Claims 11-24 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-3 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Romantier et al. (6,168,765). Regarding claim 1, Romantier discloses a reactor (Fig. 1) for performing a heat-conditioned catalytic reaction in a process fluid, said reactor comprising: plates (11) that are arranged parallel to one another at a distance and that form flat channels (Col. 8, lines 22-25) with lateral boundary areas that face one another, wherein a portion of said channels contain a solid catalyst (15, 23), (Col. 7, lines 51) and carry a process fluid, and another portion of said channels carry a heat transfer medium (16) in indirect heat contact with the process fluid, wherein said plates are flat or are provided with grooves or ribs (Figs. 2 and 3) and are coated at least partially with a catalyst on the surface that faces the process fluid (Col. 7, lines 53-54). Regarding claim 2, Romantier discloses the lateral boundary areas are jacket pieces (plate closures) , which form a pressure-resistant cuboid block with said channels, plates, and with collectors (manifold volume 18) for the process fluid the heat transfer medium (Col. 7, lines 31-33). Regarding claim 3, Romantier discloses the channels (15, 23) which carry the process fluid (Col. 7, lines 51-52) contain corrugated or pleated sheets (32, 33) (Fig. 3) which form passages the flow of process fluid. Regarding claim 10, Romantier discloses the plates are made of stainless steel material (Col. 8, lines 18-20).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 4-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Romantier '765 in view of Mulvaney, III et al. (6,159,358). Regarding claim 4, Romantier fails to disclose the sheets are perforated. Mulvaney teaches the use of perforated plates provide the advantage of altering the catalyst loading in the channels. Thus, it would have been obvious in view of Mulvaney to one having ordinary skill in the art to modify the plate reactor of Romantier with a perforated plates to control the catalyst loading in the channels. Regarding claim 5, it appears that Romantier's plates have catalyst coating on both sides of the sheets. Likewise, it would have been obvious in view of Romantier to one having ordinary skill in the art to provide coating on both sides of the sheets to ensure maximum oxidation and/or conversion of the reactant. Regarding claim 6, it is conventional to provide a support medium and/or metal carrier for the catalyst layer and it would have been obvious to do so here to provide supporting structure for the catalyst layer. Regarding claims 7-8, it is conventional to provide a catalyst layer with such thickness ranges to ensure optimum catalytic

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activity is obtained. Note, if a layer is too thin, catalytic activity will not be obtained. On the other hand, if a layer is too thick, it will likely to peel off due to internal stress and also reduces heat conductivity. Regarding claim 9, Romantier does not disclose expressly the use aluminum plates. However, it appears the selection of metallurgy for the plate material is an obvious matter of design choice depending on the process requirements such as process fluid and its operating temperature. Furthermore, Applicant has not disclosed criticality or unexpected results for selecting an aluminum material as the plate material; therefore, it would have been obvious that the plate material of Romantier will provide same heat transfer performance as the claimed invention.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom P Duong whose telephone number is (571) 272-2794. The examiner can normally be reached on 8:00AM - 4:30PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Duong  
July 20, 2004

TD



Glenn Cakdarola  
Supervisory Patent Examiner  
Technology Center 1700